



Aging Anxiety and Physical Activity Outcomes among Middle and Older Age African Americans

RESEARCH

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ABSTRACT

Aging is a natural process but may lead to aging anxiety due to physical and mental health changes. Aging anxiety is more prevalent among African Americans compared to Whites. This study aimed to investigate the correlation between aging anxiety, its four constructs including fear of older adults (contact with older adults), psychological concerns (personal/internal issues), physical appearance (physical changes), and fear of loss (loss of autonomy and social relationships), with the different types of physical activity (PA), as well as the attitudes toward PA. A total of 178 African American adults aged 40 years and older completed an online Qualtrics survey. The Lasher and Faulkender survey was utilized for the purposes of obtaining data on aging anxiety. PA was measured using questions derived from the National Health Interview Survey questionnaire and miscellaneous Questions for PA attitudes. The results revealed that fear of loss was the most anxiety-inducing factor among the participants. Females were more fearful of older adults and more anxious about aging than males. Possessing an enjoyable attitude toward PA was associated with less fear of older adults, fewer psychological concerns, and a lower total score of aging anxiety. Physical appearance constructs were correlated with age and strengthening exercises. Younger participants were more worried about their appearance than older participants. Fear of loss was higher among single and lower-income participants. Interventions and mental health programs should consider addressing the fear of loss and promoting a positive attitude toward PA to alleviate aging anxiety among middle-aged and older African Americans.

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KEYWORDS:

aging anxiety; physical activity;
gender; African American;
middle-age; older adults

TO CITE THIS ARTICLE:

Monroe-Lord, L., Harrison, E.,
Ardakani, A., Francis, S. L., Xu,
F., Marra, M. V., Weidauer, L.,
Arthur, A. E., & Sahyoun, N.
R. (2023). Aging Anxiety and
Physical Activity Outcomes
among Middle and Older Age
African Americans. *Physical
Activity and Health*, 7(1), pp.
281–292. DOI: [https://doi.
org/10.5334/paah.287](https://doi.org/10.5334/paah.287)

1. INTRODUCTION

Aging anxiety, defined as fears and concerns regarding aging, is related to different psychological outcomes, including concerns regarding the future, loneliness, and depression (Ayalon 2018; Bergman and Segak-Karpas 2018; Bergman and Segak-Karpas 2021). Four interpretable factors, including; fear of older adults, psychological concerns, physical appearance, and fear of loss of autonomy and social relationships, are identified as principles of aging anxiety by Lasher and Faulkender (1993). The majority of previous studies regarding aging anxiety focused on younger and older adult populations, and there are limited studies for middle-aged adults (Bergman and Segak-Karpas 2021). Lynch et al. (2000) showed that aging anxiety tends to decline throughout life because of gradual adaptation to age-related limitations. The higher rates of aging anxiety in middle-aged adults might result from an individual's experience of age-related changes. It's important to note that an individual's attitude towards aging can act as either a protective factor or a harmful agent for their health status (WHO, 2016). Positive attitudes and optimism about aging result in more health-promoting behaviors, such as physical and social activity (Keyes and Weterhof 2012; Doyle, McKee and Sherriff 2012). In contrast, a negative attitude and pessimism are linked to poorer physical and psychological health (Brunton and Scott, 2015; Swift et al. 2017).

Aging anxiety levels vary among people of different races and ethnicities. Aging anxiety is associated with negative stereotypes of older adults and is more common among the African American population when compared to their White counterparts (Foos, Clark and Terrell, 2006; Levy et al. 2007). Compared to their non-Hispanic White counterparts with a prevalence rate of 23%, the non-Hispanic Black population has a higher prevalence rate of physical inactivity at 30% (CDC, 2022). The African American population is also less likely to mention physical activity (PA), which is defined as any physical motion generated by skeletal muscles that necessitates the utilization of energy, and nutrition as essential elements of healthy aging than those of the White demographic (Corwin, 2009; Piggini, 2020). African American women, however, are less likely than White women to be concerned with body size and body image and are less likely to fear age-related changes in physical appearance (Sabik, 2013).

PA plays a significant role as a key contributor to achieving successful "healthy aging," encompassing a wide range of clinical, psychological, and social benefits (Bauman et al. 2016). The African American population is at disproportionately higher risk of hypertension, glucose abnormalities, cancer, type 2 diabetes mellitus, and obesity compared to other racial/ethnic groups (Kirkendoll et al. 2010). They are also less likely to receive treatment for their health issues (Bland and Sharma, 2017). It is well documented that PA can reduce the risk of hypertension and diabetes; furthermore, African Americans are also more likely to report physical inactivity during leisure time than Whites (Crespo et al. 2000; Marshall et al. 2007; Joseph et al. 2015). African Americans more frequently note physical/built and sociocultural environmental barriers to PA, including lack of access to exercise facilities, environmental safety concerns, lack of monetary resources, and a lack of leisure time (Han et al. 2011). Recognizing and addressing these challenges are crucial steps towards promoting physical activity and combating aging anxiety within the African American population. Moreover, the cultural relevance of physical activity programs can play a significant role in encouraging participation. Studies have shown that culturally tailored interventions and community-based programs focusing on physical activity can be effective in engaging African American populations (Burkart, Laurent, Alhassan, 2017; Mumba et al. 2021).

There is a gap in the literature examining the impact of PA among persons of color, especially African Americans, and their attitudes toward PA, type of exercise they most enjoy doing, and most vulnerable demographic populations on aging anxiety. Our research aimed to contribute to closing that gap and inform future policies that may protect and nourish the well-being of African American society. Thus, in this study, we aim to 1) investigate the relationship between aging anxiety and its constructs (fear of older adults, psychological concerns, physical appearance, and fear of loss) and, engagement in the different types of PA, and 2) attitudes toward PA among African American adults ages 40 years and over. The findings of this study will contribute to developing educational sessions to reduce anxiety, determine the most effective types of PA, and explore how to change individual attitudes toward PA to face aging with more ease.

2. METHODS

2.1. RESEARCH DESIGN, PARTICIPANTS, AND PROCEDURE

In this cross-sectional design, a sample of 178 African American middle and older age adults (retrieved from a larger sample size of 1,250 community-residing adults of all races) aged 40 years and beyond were recruited online via Qualtrics to answer a 142 questions. The data collection was performed between September and November 2020 in six states: Iowa, Illinois, Maryland, Rhode Island, South Dakota, and West Virginia as well as Washington D.C. Respondents for the study were selected from Qualtrics™ market research panels based on their ability to read, understand, and respond to survey questions, as well as their internet access. Panel managers followed random selection procedures to ensure a representative sample, oversampling for age (targeting 70% ages 51 to 74) and race (targeting 40% Black, Indigenous, and Persons of Color based on census data) (US Census Bureau 2019; Wong et al. 2022; Kendall et al. 2023).

2.2. SURVEY

The survey was composed of validated and reliable survey tools. In this study, we used part of the collected data that concerned sociodemographic attributes, aging anxiety (measured using Lasher and Faulkender's 1993 scale), attitudes toward physical activity (PA) as reported by Ajzen in 1991, and PA participation data obtained from the National Health Interview Survey Questionnaire.

2.2.1. Physical Activity

The six questions concerning attitudes toward PA were designed based on the Theory of Planned Behavior (Ajzen 1991). The first three questions evaluated the respondents' affective attitude by assessing their level of enjoyment of participating in PA (e.g., PA is enjoyable/unenjoyable, interesting/boring, and pleasant/unpleasant) (Ajzen 2019). The next three questions assessed the respondents' instrumental attitudes by concentrating on the perceived advantages and disadvantages of being physically active (e.g., PA is useful/useless, healthy/unhealthy, and good/bad). These questions were designed using a 7-point Likert scale with a lower score reflecting positive attitudes toward PA (i.e., 1 = positive attitude to 7 = negative attitude) (Ajzen 2019). The total attitude scores were calculated for each participant as well.

The second part of the PA practice survey was derived from the National Health Interview Survey Questionnaire. The respondents answered questions regarding their intention to be physically active and to participate in general PA, strengthening exercises, and stretching exercises using a 5-point Likert scale (1 = not likely at all to 5 = very likely) and a 9-point Likert scale for the other three PA questions (i.e., 0 = 0 days to 7 = 7 days) (CDC 2017). Those participants that selected "I am unable to do this type of activity" were considered to be at 0 days in the analysis.

2.2.2. Aging Anxiety Scale

The aging anxiety scale developed by Lasher and Faulkender (1993), was utilized in this study. This validated survey was composed of 20 items that evaluated the four factors of aging anxiety: Fear of older adults (measures external contact with older adults), psychological concerns (measures personal/internal issues), physical appearance (reflects anxiety due to physical changes caused by aging), and fear of loss (relates to loss of autonomy and social relationships). This instrument used a 5-point Likert scale ranging from strongly disagree to strongly agree (Lasher and Faulkender 1993). The scale possesses high internal consistency; in addition, it must be noted that a higher score shows a higher level of anxiety. Anxiety constructs were categorized as above or below the study population median for use in multivariable logistic regression models.

2.2.3. Demographics

The demographics information collected to elaborate sample characteristics were: gender (male, female, other), age (years), education (high school or less, more than high school), marital status (single, married), residence location (rural, suburban, and urban), ethnicity, and annual income. Self-reported height and weight were also collected from participants

to calculate body mass index (BMI) which was used to define participants' weight status (underweight, normal, overweight and obese) (CDC 2022).

2.3. STATISTICAL ANALYSIS

Descriptive statistics were calculated for all variables. Wilcoxon rank sum tests were utilized to test the relationships of aging anxiety and PA measures with the demographic variables. Moreover, Spearman correlations assessed the relationship between aging anxiety and PA measures. A stepwise multivariable logistic regression analysis was used to examine the relationship between aging anxiety constructs, total aging anxiety score, and, the different types of PA and attitudes toward PA. The models controlled for age, gender, education, income, location of residence, marital status, BMI, and different attitudes toward PA, and actual PA categories. SAS 9.4 (SAS Institute Inc, Cary, NC, USA) was used for statistical analyses. The results were considered significant at $p < 0.05$.

3. RESULTS

3.1 DEMOGRAPHIC ANALYSIS

Most participants were female (62.3%), age 60 years or older (mean age = 61.5 years). Nearly three out of four (73.6%) possessed more than a high school education, and 67% were single. About 67% of the participants had an annual income less than \$50,000. Additionally, about 50% of participants lived in urban areas. The mean BMI was 30.2 kg/m², and approximately 74% of the participants were classified as overweight or obese (Table 1).

CHARACTERISTICS	N (%)	MEAN (SD)
Gender		
Female	111 (62.36)	
Male	64 (35.96)	
Other	3 (1.69)	
Age (years)		61.5 (11.4)
40–49	30 (16.95)	
50–59	42 (23.73)	
60–69	59 (33.33)	
70+	46 (25.99)	
Education		
High school or less	47 (26.40)	
More than high school	131 (73.60)	
Marital status		
Single ¹	120 (67.24)	
Married	58 (32.58)	
Location of residence		
City	90 (50.56)	
Rural	19 (10.67)	
Suburb	69 (38.76)	
Ethnicity		
Non-Hispanic/Latino	169 (94.94)	
Hispanic/Latino	9 (5.06)	
Income (USD)		
≤20,000	57 (32.57)	
20,001–30,000	30 (17.14)	
30,001–50,000	30 (17.14)	
>50,000	58 (33.14)	
Weight status		30.2 (7.4)
Underweight (BMI < 18.5 kg/m ²)	6 (3.37)	
Normal (18.5 kg/m ² < BMI < 24.9 kg/m ²)	40 (22.47)	
Overweight (25 kg/m ² ≤ BMI < 29.9 kg/m ²)	55 (30.90)	
Obese (BMI ≥30 kg/m ²)	77 (43.26)	

Table 1 Sociodemographic characteristics of middle and older age of African American.

Note: ¹Never married, widowed, divorced, separated, BMI = body mass index.

The highest score of the aging anxiety constructs was the fear of older adults (mean = 19.1), followed by psychological concerns (mean = 18.2), physical appearance (mean = 17.3), and fear of loss (mean = 10.9). Furthermore, the total score of aging anxiety among African Americans was 65.44 (Table 2).

AGING ANXIETY CONSTRUCTS	MEAN (SD)	MEDIAN
Fear of older adults	19.10 (3.23) (Min. = 11, Max. =25)	19
Psychological concerns	18.15 (2.55) (Min. = 9, Max. =25)	18
Physical appearance	17.27 (3.07) (Min. = 10, Max. =25)	17
Fear of loss	10.92 (3.93) (Min. = 5, Max. =25)	11
Total score of aging anxiety	65.44 (7.87) (Min. = 51, Max. =100)	65

The higher PA by African Americans was related to doing daily general activities (e.g., walking for at least 10 min at a time for fun, relaxation, exercise, or to walk the dog) rather than strengthening and stretching exercises. The participants' attitudes toward PA were mostly related to their understanding of the advantages/disadvantages of PA rather than finding PA to be an enjoyable activity (Table 3).

INTENTION AND ACTUAL PA	MEAN (SD) ⁷	MEDIAN
Intention ¹	3.58 (1.37) (Min. = 1, Max. = 5)	4
General ²	3.86 (2.48) (Min. = 0, Max. = 8)	3
Strengthening ³	2.95 (2.14) (Min. = 0, Max. = 8)	3
Stretching ⁴	3.02 (2.11) (Min. = 0, Max. = 8)	3
Attitude toward PA	(Min. = 1, Max. = 7)	
Useful/useless	2.03 (1.82)	1
Healthy/unhealthy	1.74 (1.67)	1
Good/bad	1.58 (1.52)	1
Enjoyable/unenjoyable	2.47 (1.94)	2
Interesting/boring	2.51 (1.94)	2
Pleasant/unpleasant	2.46 (1.94)	2
Attitude toward advantages/disadvantages of PA⁵	5.31 (4.47)	3
Attitude toward enjoyment of PA⁶	7.43 (5.35)	7
Total score of attitudes toward PA	12.75 (9.01)	11

Among the different aging anxiety constructs, psychological concerns were significantly different between sex/gender, with females being more concerned ($p = 0.0063$). In addition, fear of loss was significantly related to the marital status and income level of the African American participants ($p = 0.0435$ and $p = 0.0401$, respectively). Aging anxiety was higher among married participants with more income than single participants with lower income. Additionally total score of aging anxiety was simply related to the gender of the participant, among other different sociodemographic variables. Female participants possessed a lower mean aging anxiety score in comparison to their male counterparts, meaning that females are more anxious about aging. The details of the finding reported in Table 4.

Table 5 reports the correlation between PA intention and the actual PA that was performed by the African American participants, the different aging anxiety constructs, and total aging anxiety. The intention to perform PA for 30 min per day for at least three days per week was positively correlated with a fear of older adults ($p = 0.0038$). However, performing strengthening activities was negatively correlated with physical appearance ($p = 0.0126$). The total score of aging anxiety was positively correlated to the intention of participating in PA and general activities ($p = 0.0435$ and 0.0401 , respectively).

Table 2 Characteristics of aging anxiety constructs of middle- and older- aged African Americans.

Note: SD = standard deviation. 5-point Likert scale (strongly disagree to strongly agree) measuring aging anxiety, with higher scores indicating higher anxiety levels (Lasher and Faulkender 1993).

Table 3 Characteristics of actual PA and attitude toward PA of middle- and older-aged African Americans.

Note: ¹I intend to perform PA for 30 min/day for at least 3 days/week over the next 2 months (future). ²During the past seven days, on how many days did you walk for at least 10 min at a time for fun, relaxation, exercise, or to walk the dog? ³How many times per week do you do physical activities specifically designed to strengthen your muscles such as lifting weights or doing calisthenics (e.g., exercising large muscle groups)? ⁴How many times per week do you do physical activities designed to stretch your muscles, such as yoga or exercises like bending side-to-side, toe-touching, and leg stretches? 5-point Likert scale (1 = not likely at all to 5 = very likely) for strengthening and stretching exercises. 9-point Likert scale (0 = 0 days to 7 = 7 days) for other physical activity questions (CDC, 2017). ⁵PA attitudes by perceived positive or negative effects of being physically active (e.g., PA is useful/useless, healthy/unhealthy, and good/bad) ⁶Affective attitude as indicated by the enjoyment level of doing PA (e.g., PA is enjoyable/unenjoyable, interesting/boring, and pleasant/unpleasant). A 7-point Likert scale was used to assess attitudes, where a score of 1 indicated a positive attitude, and a score of 7 indicated a negative attitude. (Ajzen 1991)]. PA = physical activity, ⁷SD = standard deviation.

CHARACTERISTICS	AGING ANXIETY CONSTRUCTS				
	FEAR OF OLDER ADULTS	PSYCHOLOGICAL CONCERNS	PHYSICAL APPEARANCE	FEAR OF LOSS	TOTAL SCORE OF AGING ANXIETY
	MEAN (SD)	MEAN (SD)	MEAN (SD)	MEAN (SD)	MEAN (SD)
	MEDIAN (IQR) ¹	MEDIAN (IQR) ¹	MEDIAN (IQR) ¹	MEDIAN (IQR) ¹	MEDIAN (IQR) ¹
Gender					
Female	19.02 (3.09)	17.88 (2.17)	17.05 (2.82)	10.67 (3.98)	64.67 (7.45)
	19 (16–21)	18 (16–19)	17 (15–19)	11 (8–13)	64 (60–69)
Male	19.31 (3.49)	18.84 (2.82)	17.68 (3.50)	11.26 (3.90)	67.03 (8.43)
	20 (16–21)	19 (18–21)	18 (15–20)	11 (9–14)	67 (61–74)
p-Value	0.4071	0.0063	0.3160	0.0289	0.0334
Age (years)					
40–49	19.53 (3.25)	18.60 (3.10)	16.41 (3.58)	9.8 (4.52)	64.25 (8.46)
	19 (18–21)	18 (17–20)	16 (14–17)	9.5 (6–14)	64 (58.5–71)
50–59	19.76 (3.68)	17.95 (2.64)	16.40 (2.98)	10.78 (3.89)	64.90 (8.64)
	20 (17–23)	19 (16–20)	16 (14–19)	11 (8–13)	64.5 (58–71)
60–69	18.84 (3.05)	18.32 (2.45)	18.06 (3.31)	11.44 (3.77)	66.67 (7.72)
	19 (16–21)	18 (17–20)	19 (15–20)	11 (10–14)	66 (61–73)
70+	18.63 (2.94)	17.91 (2.24)	17.63 (2.13)	11.10 (3.77)	65.28 (6.92)
	19 (16–20)	18 (17–19)	18 (16–19)	11 (10–13)	65 (60–70)
p-Value	0.3065	0.8260	0.0133	0.4597	0.5153
Education					
High school or less	19.06 (3.55)	17.84 (3.02)	17.17 (3.61)	10.74 (3.12)	64.71 (7.67)
	19 (16–21)	19 (15–20)	17 (14–19)	11 (8–13)	65 (58–70)
More than high school	19.11 (3.12)	18.26 (2.37)	17.30 (2.87)	10.98 (4.19)	65.70 (7.96)
	19 (16–21)	18 (17–20)	17 (15–19)	11 (8.13)	65 (60–72)
p-Value	0.8757	0.9284	0.8522	0.6683	0.5629
Marital status					
Single ³	19.18 (3.28)	18.05 (2.62)	17.15 (2.97)	10.59 (3.88)	64.97 (7.89)
	19 (16.5–21)	18 (16–20)	17 (15–19)	11 (8–13)	65 (59–71)
Married	18.93 (3.13)	18.34 (2.42)	17.51 (3.29)	11.60 (3.97)	66.39 (7.81)
	19 (16–21)	18.5 (17–20)	17 (15–20)	12 (10–14)	66.5 (60–72)
p-Value	0.5753	0.7573	0.6049	0.0472	0.2659
Location of residence					
City	18.98 (3.26)	18.20 (2.84)	17.33 (3.11)	10.55 (3.86)	65.02 (7.52)
	19 (16–21)	19 (17–20)	18 (15–19)	11 (8–13)	65 (60–71)
Non-city	19.21 (3.21)	18.10 (2.24)	17.20 (3.05)	11.29 (3.98)	65.87 (8.24)
	19.5 (16–21)	18 (17–20)	17 (15–19.5)	11 (9–13)	65 (60–72)
p-Value	0.5954	0.5191	0.7707	0.3112	0.7018
Income (USD)					
≤20,000	18.92 (3.25)	17.80 (2.83)	16.92 (3.26)	9.78 (4.01)	63.33 (7.83)
	19 (17–21)	18 (15–20)	17 (14–19)	10 (6–13)	63 (57–68)
20,001–30,000	19.40 (3.38)	18.51 (2.94)	17.96 (3.61)	10.23 (3.32)	66.27 (7.81)
	19 (17–22)	19 (17–21)	18.5 (15–20)	10.5 (9–12)	66 (61–73)
30,001–50,000	19.03 (3.18)	18.46 (2.40)	17.56 (3.21)	11.76 (4.52)	66.83 (8.43)
	19 (16–21)	19 (17–20)	18 (16–19)	11 (10–14)	66 (62–72)
>50,000	19.22 (3.27)	18.20 (2.19)	17.15 (2.48)	11.89 (3.59)	66.48 (7.59)
	19.5 (16–21)	18 (17–20)	17 (15–19)	12 (10–14)	65 (61–71)
p-Value	0.9056	0.5531	0.4098	0.0140	0.0875

Table 4 Aging anxiety and different sociodemographic characteristics of African American middle age and older adults.

Note: ¹Interquartile range. ²Standard deviation ³Never married, widowed, divorced, and separated. Bolded p-values indicate a significant relationship. 5-point Likert scale (strongly disagree to strongly agree) measuring aging anxiety, with higher scores indicating higher anxiety levels (Lasher and Faulkender 1993).

	FEAR OF OLDER ADULTS	PSYCHOLOGICAL CONCERNS	PHYSICAL APPEARANCE	FEAR OF LOSS	TOTAL SCORE OF AGING ANXIETY
Intention¹					
Correlation coefficient	0.2160	0.0925	0.0210	0.0266	0.1523
p-Value	0.0038	0.2220	0.7806	0.7241	0.0435
General²					
Correlation coefficient	-0.0732	0.0469	0.0221	-0.0330	0.1549
p-Value	0.3316	0.5358	0.7694	0.6614	0.0401
Strengthening³					
Correlation coefficient	-0.03395	-0.0290	-0.1870	-0.0740	-0.0679
p-Value	0.6529	0.7015	0.0126	0.3262	0.3703
Stretching⁴					
Correlation coefficient	0.0672	-0.0155	-0.0743	0.0221	0.0804
p-Value	0.3723	0.8382	0.3252	0.7692	0.2886

There was a significant negative relationship between positive attitudes towards physical activity, including useful, healthy, good, enjoyable, interesting, and pleasant attitudes, and the fear of older adults. Participants who held positive attitudes towards physical activity had less fear of older adults. In addition, all PA attitudes, except useful/useless attitudes, were negatively related to possessing psychological concerns, which means that a positive attitude results in less concern about psychology. Three positive attitudes, namely, healthy, enjoyable, and pleasant, were related to fear of loss. However, no relationship between PA attitude and physical appearance in this set of analyses was detected. Finally, all the PA attitudes were significantly related to total aging anxiety (Table 6).

	FEAR OF OLDER ADULTS	PSYCHOLOGICAL CONCERNS	PHYSICAL APPEARANCE	FEAR OF LOSSES	TOTAL SCORE OF AGING ANXIETY
Useful/useless					
Correlation coefficient	-0.1972	-0.0451	-0.0409	-0.1008	-0.1802
p-Value	0.0085	0.5533	0.5893	0.1815	0.0170
Healthy/unhealthy					
Correlation coefficient	-0.2685	-0.1761	-0.0953	-0.1780	-0.2877
p-Value	0.0003	0.0208	0.2121	0.0187	0.0001
Good/bad					
Correlation coefficient	-0.2070	-0.1541	-0.0500	-0.0992	-0.2180
p-Value	0.0057	0.0416	0.5098	0.1886	0.0037
Enjoyable/unenjoyable					
Correlation coefficient	-0.3418	-0.2577	-0.1064	-0.1731	-0.3731
p-Value	<0.0001	0.0006	0.1585	0.0208	<0.0001
Interesting/boring					
Correlation coefficient	-0.3388	-0.17129	-0.1149	-0.1049	-0.3060
p-Value	<0.0001	0.0234	0.1289	0.1643	<0.0001
Pleasant/unpleasant					
Correlation coefficient	-0.2730	-0.2125	-0.1010	-0.1803	-0.3277
p-Value	0.0002	0.0046	0.1725	0.0160	<0.0001
Attitude toward PA advantage/disadvantage¹					
Correlation coefficient	-0.23011	-0.1092	-0.0618	-0.12482	-0.22623
p-Value	0.0020	0.1489	0.4136	0.0969	0.0025
Attitude toward PA enjoyment²					
Correlation coefficient	-0.3312	-0.2220	-0.1235	-0.1624	-0.3572
p-Value	<0.0001	0.0031	0.1014	0.0303	<0.0001
Total score attitude toward PA					
Correlation coefficient	-0.3221	-0.2166	-0.1038	-0.1665	-0.3438
p-Value	<0.0001	0.0039	0.1690	0.0263	<0.0001

Table 5 Aging anxiety, aging anxiety constructs, and PA.

Note: ¹I intend to perform PA for 30 min/day for at least 3 days/week over the next 2 months (future). ²During the past seven days, how many days did you walk for at least 10 min at a time for fun, relaxation, exercise, or to walk the dog? ³How many times per week do you do physical activities specifically designed to strengthen your muscles, such as lifting weights or doing calisthenics (e.g., exercising large muscle groups)? ⁴How many times per week do you do physical activities designed to stretch your muscles, such as yoga or exercises like bending side-to-side, toe-touching, and leg stretches? 5-point Likert scale (1 = not likely at all to 5 = very likely) for strengthening and stretching exercises. 9-point Likert scale (0 = 0 days to 7 = 7 days) for other physical activity questions (CDC, 2017). 5-point Likert scale (strongly disagree to strongly agree) measuring aging anxiety, with higher scores indicating higher anxiety levels (Lasher and Faulkender 1993). Bolded p-values indicate a significant relationship.

Table 6 Aging anxiety and attitudes toward PA.

Note: ¹PA attitudes via the perceived positive or negative effects of being physically active (e.g., PA is useful/useless, healthy/unhealthy, and good/bad). ²Affective attitude as indicated by the enjoyment level of participating in PA (e.g., PA is enjoyable/unenjoyable, interesting/boring, and pleasant/unpleasant). A 7-point Likert scale was used to assess attitudes, where a score of 1 indicated a positive attitude, and a score of 7 indicated a negative attitude. (Ajzen 1991). ³Physical activity. 5-point Likert scale (strongly disagree to strongly agree) measuring aging anxiety, with higher scores indicating higher anxiety levels (Lasher and Faulkender 1993). Bolded p-values indicate a significant relationship.

Perceiving PA as a tool that has more advantages for individuals was significantly related to a lower fear of older adults and generally a lower score of aging anxiety. In addition, perceiving PA as a tool for enjoyment was related to all the aging anxiety constructs and the total score of aging anxiety, except physical appearance (Table 6).

The results from Table 7 revealed that gender and perceiving PA as enjoyable were significant independent predictors of the fear of older adults. Females were approximately two times more likely to fear older adults than male participants ($p = 0.0406$). In addition, for each one-point increase in the score of the enjoyment PA attitude, the participants were 1.1 times more likely to be less afraid of older adults and have psychological concerns ($p = 0.003$ and $p = 0.0306$, respectively). Among the different age groups, participants aged 40–49 years were 3.7 and 3.3 times more likely to be anxious about their appearance when compared to participants aged 60–69 years and above 70 years ($p = 0.0118$ and $p = 0.0408$, respectively). In addition, the participants aged 50–59 years were 2.4 times more likely to be anxious about their appearance in comparison to their counterparts aged 60–69 years ($p = 0.0428$).

	REFERENCE	ODDS RATIO	95% CI ¹	P-VALUE
Fear of older adults				
Gender	Female	1.993	1.03–3.85	0.0406
Attitude toward PA ² enjoyment		1.121	1.05–1.19	0.0003
Psychological concerns				
Attitude toward PA enjoyment		1.066	1.01–1.12	0.0306
Physical appearance				
Age (years)	40–49 vs. 50–59	1.568	0.53–4.63	0.4153
	40–49 vs. 60–69	3.737	1.34–10.42	0.0118
	40–49 vs. ≥70	3.301	1.04–8.76	0.0408
	50–59 vs. 60–69	2.383	1.02–5.52	0.0428
	50–59 vs. ≥70	1.932	0.79–4.68	0.1444
	60–69 vs. ≥70	0.811	0.36–1.81	0.6099
Strengthening		1.201	1.02–1.40	0.0237
Fear of loss				
Marital status	Married	0.434	0.20–0.90	0.0264
Income (USD)	≤20,000 vs. 20,001–30,000	1.418	0.57–3.51	0.4502
	≤20,000 vs. 30,001–50,000	3.501	1.31–9.34	0.0124
	≤20,000 vs. >50,000	2.276	1.02–5.06	0.0441
	20,001–30,000 vs. 30,001–50,000	2.469	0.82–7.37	0.1055
	20,001–30,000 vs. >50,000	1.605	0.62–4.15	0.3299
	30,001 vs. >50,000	0.650	0.23–1.78	0.4042
Total score of aging anxiety				
Gender	Female	2.354	1.19–4.63	0.0013
Attitude toward PA enjoyment		1.136	1.06–1.21	<0.0001

Table 7 Association between aging anxiety and its constructs, as well as the association between PA and attitudes toward PA, while controlling for different demographic variables.

Note: 5-point Likert scale (1 = not likely at all to 5 = very likely) for strengthening and stretching exercises. 9-point Likert scale (0 = 0 days to 7 = 7 days) for other physical activity questions (CDC, 2017). A 7-point Likert scale was used to assess attitudes, where a score of 1 indicated a positive attitude, and a score of 7 indicated a negative attitude (Ajzen 1991). ¹Confidence interval, ²physical activity. Bolded p-values indicate the significant relationship. 5-point Likert scale (strongly disagree to strongly agree) measuring aging anxiety, with higher scores indicating higher anxiety levels (Lasher and Faulkender 1993).

Another predictor of physical appearance concerns was participating in strengthening activities. For each one-point increase in the score of strengthening activity, the participants were 1.2 times more likely to be less concerned about their physical appearance ($p = 0.0237$). Furthermore, marital status and income level were independent predictors of fear of loss. Those participants who were married were 57% less likely to fear loss ($p = 0.0246$). With respect to the different income group levels, those participants with less than \$20,000 per year were 3.5 and 2.3 times more likely to fear a loss in comparison to participants who earned between \$30,001 and \$50,000 and those who earned more than \$50,000 per year ($p = 0.0124$ and $p = 0.0441$, respectively).

In the last part of the analysis, gender and enjoyment PA attitudes were identified as independent predictors of aging anxiety ($p = 0.0013$ and $p < 0.0001$, respectively). Female participants were 2.3 times more likely to experience aging anxiety than their male counterparts, whereas, for each one-point increase in the score of enjoyment PA attitudes, participants were 1.1 times less likely to have aging anxiety.

4. DISCUSSION

The current study evaluated how different sociodemographic variables in the context of participating in PA and attitudes toward PA are related to aging anxiety and its constructs. To the best of our knowledge, this is the first study that has collected data on all these factors together to assess aging anxiety and its one-by-one constructs among African Americans. The findings of this study revealed which individual sociodemographic and PA factors may be associated with lower anxiety about aging among this minority population. Our results indicated that the highest anxiety regarding aging was fear of loss, while the lowest was fear of older adults. Overall, participants had a positive attitude toward the advantages and enjoyment of PA.

Among the different sociodemographic factors, gender, age, income, and marital status were found to be associated with aging anxiety and its constructs. Previous research on aging anxiety has shown that it relates to age and gender. These studies were on Hispanic and Taiwanese populations and showed that younger people have higher levels of aging anxiety than older adults (Fernández-Jiménez et al. 2020; Yu-Jing 2012). In our study, females were about 2 times more afraid of older adults and in general, were approximately 2.3 times more anxious about aging than their male counterparts. Research findings also revealed that males and females experience aging and anxiety differently based on their current life period (Lynch 2016). The results showed that the younger participants were more anxious about their physical appearance. The trend of this construct of aging anxiety decreased with aging, which means that participants aged 40–49 years old were more anxious about their appearance in comparison to the same group aged 50–59 years. In addition, married participants were less afraid of losses than single participants. A previous study did show that an older person living alone suffers from more anxiety (Yu, Choe and Kang 2020). Singles who usually live alone may imagine themselves in the same situation in the future and thus may experience more fear of loss regarding everything they have in their lives. Furthermore, the lower-income participants possessed a higher level of fear of loss than higher income participants. Individuals with a higher income level perceive their belongings as safer than those of someone with a lower income level.

Among the four types of physical activity, strengthening exercises were significantly associated with the physical appearance construct of aging anxiety in both the univariate and multivariate analyses. Increasing the number of strengthening exercises was associated with lower anxiety regarding physical changes in appearance. Strength training conserves bone mass and muscle, reduces sarcopenia, prevents dementia and retains motor function in older adults (Marinus et al. 2019; Müller et al. 2018). Another study also showed that heavy-load strength training is a multifaceted intervention that spans both health and disease spectrums, offering a promising approach to enhance physical fitness, mitigate illness symptoms, and ultimately improve the overall quality of life for individuals across various health conditions (Cannataro et al. 2022; Malorgio et al. 2021). These reasons could provide a rationale for the lower fear of physical appearance in our participants. Moreover, possessing an enjoyable attitude toward PA predicted a reduction in two constructs out of four in respect of aging anxiety, including fear of older adults and psychological concerns, as well as aging anxiety. This means that positive attitudes toward PA may result in lower anxiety with respect to aging among African American middle-aged and older adults. Meanwhile, perceiving PA from the advantage/disadvantage perspective was not associated with lower aging anxiety or its constructs.

A limitation of this study is that it consisted of a convenience and small sample size and, therefore, the findings are not generalizable. Additionally, as the study design was cross-sectional, we could only determine associations between variables, not causality. A larger study may provide more evidence on the association between PA and aging anxiety and may be a basis for interventions that could improve the mental and physical health of individuals. The primary strength of this study is its focus on African Americans. Limited data is available on this population group and especially on this age groups, Future studies of minority populations could contribute to finding strategies to prevent aging anxiety based on race and culture.

5. CONCLUSIONS

The results showed aging anxiety and fear of older adults differed significantly by gender. African American females are more anxious than males regarding aging. Perceiving PA as an enjoyable activity also resulted in less fear of older adults, fewer psychological concerns, and less aging anxiety. Younger African Americans were more worried about their physical appearance than older individuals, and strengthening exercises were identified as an effective way to control this concern of aging anxiety. Furthermore, the results of the study indicated that fear of loss was the most anxiety-inducing factor among the participants. Fear of loss was also associated with marital status and income level. Utilizing the findings of this study can help to develop educational workshops to control aging anxiety while discussing the health benefits of PA participation.

DATA ACCESSIBILITY STATEMENTS

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to measures to protect participant confidentiality.

ETHICS AND CONSENT

The Iowa State University Institutional Review Board approved this study protocol on September 16, 2020, which was deemed exempt with the ID 20–384.

Informed consent was obtained from all subjects involved in the study.

FUNDING INFORMATION

This research was funded by the USDA NE-1939 Multistate Project “Improving the health span of aging adults through diet and physical activity” grant number 1021991; supported by the Lura M. Lovell Fellowship; funded by the USDA/NIFA Hatch Project grant number 1011487; funded by the University of the District of Columbia Multistate Project, West Virginia Agricultural and Forestry Experiment Station, National Institute of Food and Agriculture, U.S. Department of Agriculture, Hatch/Multi-State grant number 1021322.

COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR CONTRIBUTIONS

Conceptualization, L.M.-L., A.A., L.W. and S.L.F.; methodology, L.M.-L., E.H., A.A., S.L.F., F.X., M.V.M., L.W., and N.R.S. formal analysis, L.M.-L., A.A., E.H. investigation, L.M.-L., A.A., E.H., writing the first draft of the manuscript, L.M.-L., A.A., review and editing, L.M.-L., A.A., E.H., S.L.F., F.X., M.V.M., L.W., and N.R.S. All authors have read and agreed to the published version of the manuscript.

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TO CITE THIS ARTICLE:

Monroe-Lord, L., Harrison, E., Ardakani, A., Francis, S. L., Xu, F., Marra, M. V., Weidauer, L., Arthur, A. E., & Sahyoun, N. R. (2023). Aging Anxiety and Physical Activity Outcomes among Middle and Older Age African Americans. *Physical Activity and Health*, 7(1), pp. 281–292. DOI: <https://doi.org/10.5334/paah.287>

Submitted: 15 June 2023
Accepted: 03 September 2023
Published: 02 October 2023

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